The American Fertilizer

L 94 MAY 24, 1941 No. 11

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The AMERICAN AGRICULTURAL CHEMICAL Co.

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...THE...

AMERICAN FERTILIZER

"That man is a benefactor to his race who makes two blades of grass to grow where but one grew before."

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Anti-Trust Fertilizer Trials Set for 1942

Companies Given Ample Time to Prepare Case. "Nolo Contendere" Pleas by Twenty-three Defendants. N. F. A. Issues Statement.

JUDGE Johnson J. Hayes has set January 5, 1942, as the date for the trial of 100 fertilizer manufacturing companies and certain individual officers of those companies, who are charged with violating the Sherman Anti-Trust Act. Of the original 102 defendants, 77 pleaded "not guilty," 23 pleaded "nolo contendere" while the government entered a "nolle prosequi" as to two defendants, the Arkansas Fertilizer Company and John F. Maybank.

The motions to quash the indictment were denied, the Judge saying, however, that if upon consideration of the matter he should later decide that the indictment is bad, he would set aside his ruling, quash the indictment, and strike out the pleas. Fifteen days were granted to defendants to amend the motions to quash and to file any other pleas which ordinarily should be filed before entry of a plea of "not guilty."

In setting January 5th as date for trial Judge Hayes told counsel for the defense he is waiting until that time so ample opportunity may be allowed for them to properly prepare their case and co-ordinate their evidence and defense. This is being done, he explained, so the trial can be handled as rapidly as is practical for all concerned.

Estimates of the length of time required for trial were placed at six or eight months.

Judge Hayes intimated that the jury that will be chosen to hear the case will not be under guard or be required to stay together the entire length of the trial. He emphasized the fact that all who are involved in the case must of necessity be under great strain and tension and said the court is anxious to relieve this as far as possible.

Jurors have their own personal affairs to attend to and the court must take this into consideration and not place them at an unnecessary hazard by failing to give them an opportunity, at reasonable intervals, to recess and attend to this business, Judge Hayes explained.

Although no official entry was made, counsel for defendants and the government intimated request will not be made for the jurors to be kept together and under guard.

Judge Hayes also announced that all witnesses who appeared before the grand jury and are under oath of secrecy as to what took place there may provide counsel, and other consultants, with information desired and may co-operate to the fullest extent without violating their oath of secrecy. Exact phrasing as to order on the motion for release from secrecy will be signed shortly.

The defendants pleading nolo contendre and thus evidencing willingness to accept a consent decree are the Superphosphate Association, thirteen companies now or formerly members of that organization, and nine individuals in that division of the industry. Government counsel asked the court not to enter judgment in respect of these defendants until the others had been tried.

Leo F. Tierney, Chicago, formerly an attorney for the anti-trust division of the Department of Justice, has been selected by the defendants' advisory committee to coordinate the evidence and the defense in preparation for the trial, and will act in the same capacity during the progress of the trial.

"Our industry faces this court action at a time when its energies are being taxed to meet

(Continued on page 24)

New Peak in 1940 Fertilizer Tonnage

MORE commercial fertilizer was used by American farmers in 1940 than in any previous year. The tonnage distributed by commercial producers was moderately lower than in 1930 and in 1937 but this was more than offset by the rise in the amount distributed by the Tennessee Valley Authority and the Agricultural Adjustment Administration.

It seems likely that another increase of moderate extent will be registered this year. Fertilizer tag sales in the first four months were 9 per cent larger than in the corresponding period of 1940.

The total quantity of commercial fertilizer used in the United States in 1940 is placed by The National Fertilizer Association at 8,311,000 tons. This includes 7,839,000 tons sold by commercial producers, 27,000 tons distributed by TVA and 444,000 tons distributed by AAA. The increase over 1939 amounted to 529,000 tons, with the commercial industry accounting for 234,000 tons of the increase and the Government agencies accounting for the other 295,000 tons.

The tonnage figures do not include 47,823 tons of phosphate rock used in Illinois in 1940. Such data have been available only for the last two years and consequently are excluded from the annual tonnage comparisons. Neither do the data on consumption include substantial quantities of fertilizers and fertilizer materials which are produced here and shipped to our island possessions. Fertilizer exports from the mainland to Puerto Rico in the last three years were: 1938, 90,250 short tons; 1939, 100,200 tons; and 1940, 153,500. Exports to Hawaii were: 1938, 35,250 tons; 1939, 49,600 tons; and 1940, 63,450 tons.

Distribution of fertilizer by Government agencies has been increasing in importance in recent years. The ratio rose from practically nothing in 1935 to 5.66 per cent in 1940. These ratios are based on tonnages. If based on the amount of plant food distributed, they would be considerably higher, since much of the superphosphate distributed by TVA and AAA is of the concentrated grade. The proportion of plant food used in 1940 accounted for by these two agencies was 9.68 per cent, in contrast to the 5.66 per cent of gross tonnage.

The market for fertilizers has been widening and becoming more diversified in recent years. Total tonnage in 1940 (including Government distribution) was 88,000 tons larger than in 1930. The amount used on cotton, however, was 667,000 tons less, which means that 755,000 tons more of fertilizer were used on other crops in 1940 than were used ten years ago. The upward trend in the use of fertilizer has been particularly marked in the case of grasslands, fruits, and vegetables.

Tonnage figures in themselves fail to tell a complete story of plant food consumption in this country since there has been a significant increase in the amount of plant food contained in a ton of fertilizer. If we take *tonnage* in 1920 as 100, then it was 115 in 1930 and 116 in 1940. If we take total *plant food consumption* as 100 in 1920, it was 148 in 1930 and by 1940 it was up to 164. While tonnage was only 16 per cent greater than twenty years earlier, the amount of plant food used was 64 per cent greater.

Use of higher analysis fertilizers is an effective way of reducing fertilizer cost to the farmers as the transportation and handling costs per unit of plant food are lowered. This, combined with a favorable level of fertilizer prices per ton, has resulted in a marked reduction in the farmers' bill for fertilizer.

In the five years, 1936 through 1940, farmers purchased fewer tons of fertilizer than they did in 1926-1930 but they got 10.3 per cent more plant food. In contrast to this increase in what they got, their aggregate fertilizer bill was 14.1 per cent lower.

(Continued on page 24)

Changes in Fertilizer Sales by Geographic Regions

Region	Sales in 3 Peak Years 1930 = 100			Changes from 1926-30 to 1936-40 Five-Year Totals	
	1930	1937	1940	Tons	Per Cent
New England	100	92.8	84.3	—234,000	—13.2%
Middle Atlantic	100	110.9	112.0	+567,000	+15.1
East North Central	100	100.4	111.0	+257,000	+ 6.8
West North Central	100	109.1	129.1	+135,000	+28.3
South Atlantic	100	101.5	90.7	—959,000	— 4.8
South Central	100	84.8	85.5	—800,000	—10.1
Western	100	160.0	152.1	+674,000	+90.0
United States	100	99.7	95.3	—360,000	— 0.9

FERTILIZER CONSUMPTION IN THE UNITED STATES

Based on Tax Tag Sales, Records of Government Officials, or Estimates.

State	Sold by Commercial Producers				Distributed by Govt. Agencies	Total Consumption
	1937	1938	1939	1940	1940	1940
Maine	140,000	140,000	132,500	135,000	7,520	142,520
New Hampshire	18,000	16,500	14,500	16,500	6,727	23,227
Vermont	25,260	20,067	12,664	14,585	14,157	28,742
Massachusetts	74,274	69,175	63,974	64,998	4,166	69,164
Rhode Island	11,000	12,200	11,000	12,500	343	12,843
Connecticut	67,441	56,274	59,000	61,753	1,015	62,768
New England	335,975	314,216	293,638	305,336	33,928	339,264
New York	350,000	332,881	318,992	369,911	27,807	397,718
New Jersey	183,952	171,722	176,170	183,567	0	183,567
Pennsylvania	370,162	358,415	357,415	360,000	6,268	366,268
Middle Atlantic	904,114	863,018	852,577	913,478	34,075	947,553
Ohio	362,205	324,228	345,585	363,320	2,891	336,211
Indiana	226,887	220,967	201,420	255,059	2,599	257,658
Illinois	36,076	36,132	40,673	49,753	725	50,478
Michigan	144,500	132,702	144,811	166,564	0	166,564
Wisconsin	42,872	46,433	42,623	64,253	6,268	70,521
East North Central	812,540	760,462	775,112	898,949	12,483	911,432
Minnesota	12,386	13,778	13,455	18,627	794	19,421
Iowa	8,523	11,146	13,018	13,745	1,898	15,643
Missouri	82,498	70,301	67,733	87,577	5,364	92,941
North Dakota	400	650	1,000	1,800	0	1,800
South Dakota	150	150	300	500	0	500
Nebraska	500	1,794	2,090	2,200	0	2,200
Kansas	15,267	18,099	14,366	17,931	69	18,000
West North Central	119,724	115,918	111,962	142,380	8,125	150,505
Delaware	44,466	36,281	35,500	35,500	6	35,506
Maryland	186,285	166,408	165,342	160,315	828	161,143
Dist. of Columbia	1,600	1,700	1,800	1,800	0	1,800
Virginia	440,430	405,179	418,089	393,069	34,063	427,132
West Virginia	58,000	53,500	56,500	57,600	19,185	76,785
North Carolina	1,236,564	1,104,788	1,215,887	1,076,730	14,429	1,091,159
South Carolina	771,198	660,963	678,859	685,310	542	685,852
Georgia	866,360	768,323	689,790	762,725	20,014	782,739
Florida	579,399	555,475	556,782	568,671	289	568,960
South Atlantic	4,184,302	3,752,617	3,818,549	3,741,720	89,356	3,831,076
Kentucky	117,078	109,968	120,009	123,102	149,846	272,948
Tennessee	141,325	128,291	130,354	147,311	64,432	211,743
Alabama	629,260	528,850	562,100	575,900	40,908	616,808
Mississippi	325,320	325,836	318,761	319,508	3,956	323,464
Arkansas	68,675	67,800	74,122	101,000	15,290	116,290
Louisiana	157,318	148,542	160,488	156,775	807	157,582
Oklahoma	6,845	8,005	7,622	7,363	316	7,679
Texas	89,400	84,276	95,226	118,199	768	118,967
South Central	1,535,221	1,401,568	1,468,682	1,549,158	276,323	1,825,481
Montana	4,000	5,000	5,000	4,500	0	4,500
Idaho	4,417	9,015	6,500	7,000	0	7,000
Wyoming	1,400	1,500	2,100	2,100	0	2,100
Colorado	1,800	4,393	4,578	5,557	0	5,557
New Mexico	3,218	2,240	2,243	2,406	0	2,406
Arizona	10,500	6,500	7,000	6,902	190	7,092
Utah	2,000	2,000	2,300	3,050	0	3,050
Nevada	500	500	500	500	0	500
Washington	28,000	27,000	23,750	24,840	11,867	36,707
Oregon	15,000	14,500	12,750	15,280	5,154	20,434
California	232,795	208,353	218,523	216,196	0	216,196
Western	303,630	281,001	285,244	288,331	17,211	305,542
United States	8,195,506	7,488,800	7,605,764	7,839,352	471,501	8,310,853
Distributed by AAA	25,081	66,946	156,949	444,321		
Distributed by TVA	21,622	13,853	18,356	27,180		
U. S. Total Consumpt'n	8,242,209	7,569,599	7,781,069	8,310,853		

The Seventeenth Annual Convention of the National Fertilizer Association

WITH outstanding speakers on topics geared to current problems of the day, the Seventeenth Annual Convention of The National Fertilizer Association will open a three-day session June 9th, at the Greenbrier Hotel, White Sulphur Springs, W. Va.

Agriculture in national defense, chemicals in national defense, and regional agricultural problems as affected by the current emergency will constitute the broad fields in which the talks will be made. Dr. E. R. Weidlein, Director of Mellon Institute, will speak on some vital phases of the chemical industry in the present emergency. Dr. R. F. Poole, President of Clemson College, will talk on "Opportunities in Southern Agriculture."

Arrangements are also under way for a dinner speaker of national reputation who will address the convention on some of the keystones of national defense.

Important meetings will be held Monday, June 9th. The Executive Committee of the Board of Directors will meet at 10.00 A. M. The Board of Directors will convene at 2.30 P. M., the Nominating Committee at 6.30 P. M. A meeting of defendants will be held at 8.30 P. M., and a meeting of defendants' lawyers will be arranged during the day. Mr. Leo Tierney, Coordinator, in charge of defense activities, will be present.

The convention golf tournament entry blanks have been mailed, and arrangements for the tournament are under way in the hands of the Golf Committee: A. L. Walker, Jr., chairman; A. B. Baker, W. J. Murphy, E. H. Jones, H. F. Ayer, C. F. Burroughs, Jr., and J. M. Coppinger.

Through the courtesy of William E. Drips, Director of Agriculture, National Broadcasting Company, a coast-to-coast broadcast of convention activities has been arranged for June 13th. Mr. Brand will make the broadcast from Washington. The definite time will be set and published.

The Greenbrier Hotel will make the following reduced rates, American plan, for convention: Single room without bath, $9 per day; room sharing bath, $10 per day per person; single room with bath, $11 per day per person. Rates apply to those who arrive prior to the convention and to those who desire to remain for a short period after the convention. Reservations should be made directly with the hotel.

Summer tourist rates to White Sulphur Springs will be in effect from practically all points in the United States. In Central, Trunk Line, and New England territories, summer tourist tickets are on sale daily. In Southeastern territory, tickets are on sale daily, good for 30 days from date of sale. In Southwestern territory there is a 30-day limit on summer tourist tickets to White Sulphur Springs. In Western territory, 30-day excursion tickets to Chicago or St. Louis should be purchased, and summer tourist tickets from there to White Sulphur Springs. Thirty-day excursion tickets may be purchased on the same basis as were the former 10-day excursion tickets. Tanscontinental territory tickets are good for three months, and divers routes may be arranged.

THE GOLFERS' PARADISE AT WHITE SULPHUR SPRINGS

The Convention Golf Tournament

The Golf Committee of the National Fertilizer Association, headed by A. L. Walker, Jr., has arranged an outstanding program of events for the afternoons of the coming Convention at White Sulphur Springs. The schedule for the three days calls for eighteen separate competitions for the men, with attractive prizes for winners and runners-up being offered by various companies in the fertilizer industry. For the ladies, there will be two putting competitions, and in addition the committee is planning an added regulation medal play tournament if sufficient entries are received.

The list of events include medal play handicap, match play against par, kickers handicap, tombstone handicap, match and medal play for "veterans," and a championship contest covering selected scores from play throughout the three days of the meeting. This schedule offers an opportunity for every golfer to come home a winner, whether he be rated as expert, good, medium, duffer or super-duffer.

All contestants in the men's events must be connected with companies which are members of the National Fertilizer Association or are directly affiliated with such companies. Those who expect to play, are requested to send their entries. together with their club handicaps, to the chairman of the Committee, A. L. Walker, Jr., 75 East 45th St., New York City, so that the proper handicaps can be assigned for the convention tournament.

The greens' fee, as arranged by the Association, will be $2.50 per day, which includes club cleaning and a locker at the Golf and Tennis Club. This fee, which covers play on all the Greenbrier courses, will also apply for the three days before and the three days after the Convention.

The Golf Committee for the 1941 Convention consists of A. L. Walker, Jr., Chairman; A. B. Baker, W. J. Murphy, E. H. Jones, H. F. Ayer, C. F. Burroughs, Jr., J. M. Coppinger.

The schedule of events is as follows:

Monday, June 9th.

Medal Play Handicap; Match Play *vs.* Par; Kickers' Medal Handicap; Tombstone Handicap; Low Gross Score; Veterans' Match Play *vs.* Par.

Tuesday, June 10th.

Medal Play Handicap; Veterans' Medal Handicap; Match Play *vs.* Par; Kickers' Medal Handicap; Tombstone Handicap; Low Gross Score.

Wednesday, June 11th.

Medal Play Handicap; Match Play *vs.* Par; Kickers' Medal Handicap; Tombstone Handicap; Low Gross Score.

June 9th, 10th and 11th.

Championship (Ringer Handicap).

Ladies' Events, June 10th.

Putting Contest for Golfers; Putting Contest for Non-Golfers; Kickers' Medal Handicap.

The Donors of Prizes

The American Agricultural Chemical Co. (Rock Department), New York City.
American Cyanamid Co., New York City.
American Potash & Chemical Corporation, New York City.
The Barrett Company, New York City.
F. W. Berk & Co., Inc., New York City.
California Chemical Co., New York City.
Chilean Nitrate Sales Corporation, New York City.
E. I. du Pont de Nemours & Co. (Ammonia Department), Wilmington, Del.
International Agricultural Corporation (Rock Department), New York City.
The Potash Company of America, Baltimore, Md.
Southern Phosphate Corporation, Baltimore, Md.
Texas Gulf Sulphur Company, New York City.
Union Special Machine Company, Chicago, Ill.
United States Potash Company, New York City.
The National Fertilizer Association.
Union Potash & Chemical Co.
U. S. Phosphoric Products Co.
French Potash & Import Co., Inc.

A Close Match at White Sulphur Springs

May Crop Report

Early reports on crops show conditions generally favorable, though in many ways unusual. Nearly everywhere east of the Rockies, April was warm and from Minnesota and Illinois eastward April temperatures averaged nearly as high as is normal for the first of May. Southwestern ranges, favored by abundant rains, are blooming like a flower garden, and in the West as a whole ranges have rarely had a better start. April showers have been heavier in most of the "Dustbowl" than in the eastern end of the Corn Belt. Farmers in a vast area extending from North Dakota to the Rio Grande, where lack of rainfall has limited crop production in most of the last 10 years, have been complaining this year that seedings of spring crops are being delayed by frequent rains. On the other hand, in the Ohio Valley and most Eastern States the spring has been dry; farmers are well up with their work but many have been preparing their corn land in clouds of dust and are wishing for rain. Assuming more nearly normal weather in future months in areas now too wet or too dry, there seem to be very few States where prospects for crops and pastures are now definitely below average for this season of the year.

Winter Wheat and Grains

Winter wheat has been favored and conditions on May 1st indicated a crop of about 653 million bushels. This would be fewer bushels than were harvested in 1937 and 1938 but more than were harvested in 25 of the last 30 years. The acreage abandoned is expected to be less than in any year since 1931 and the yield per seeded acre the highest since that year.

Rye prospects on May 1st were fairly promising in all States suggesting a good, but not exceptional, yield on an acreage slightly above average, and a total crop about 12 per cent above that harvested last year. Oats look promising throughout the South.

Fruit Crops

It is too early for production forecasts for some fruit crops in important northern and western areas, but prospects on May 1st were favorable in nearly all major producing sections, and ample supplies of most fruits seem assured. Peach production in the 10 early southern states is indicated to be more than 50 per cent larger than last season's crop and the 10-year average; and although the prospective harvest of California Valencias, which furnish the main supply of summer oranges, is now somewhat smaller than was indicated earlier in the season, a fairly large crop is expected.

Winter and spring freeze damage, to date, has been negligible except in some of the Central States, in New York, and in western Oregon and Washington. In the fruit areas of Iowa, Nebraska, Kansas, and Missouri adjacent to the Missouri River, and in some parts of eastern New York, trees were severely damaged during the period of sub-freezing temperatures which occurred last November; and some frost damage occurred during April to peaches in New York and New England, to cherries, chiefly sour varieties, in western Washington, and to cherries, prunes, and peaches in western Oregon. The long period of excessive rainfall which extended over most of the winter and spring months in California terminated early in April, and orchards and vineyards have dried out sufficiently to permit necessary field work. Although most fruit crops in that State probably were damaged to some extent by the heavy rains, fair to average crops of most fruits are expected.

Truck Crops

Progress of commercial truck crops during April was favorable in all southern States except Texas, and in most Eastern and Midwestern areas. Excessive rains in Texas in late April caused considerable damage to cucumbers, onions, and tomatoes. California truck crops show the effects of continued rains but clearer weather during the latter part of the month enabled growers to complete a large amount of badly needed field work. In the Pacific Northwest and in some areas of the Rocky Mountain States, the growth of truck crops was retarded by low temperatures. Additional rainfall is needed in areas along the Atlantic Coast.

Abundant supplies of strawberries, asparagus, and snap beans are expected during May and ample supplies of cabbage, beets, celery, green peas, carrots, lettuce, and spinach are available. Shipments of early potatoes are relatively light at present but will increase during the month. Prospective production of potatoes in the Southern States and California is large. Onion marketings will increase as the Texas harvest gets under way following the recent heavy rains which reduced the crop to below-average. Lighter-than-usual supplies of cantaloups, green peppers, tomatoes, and green lima beans are in prospect during May.

BARRETT CONTINUES PRESENT NITRATE OF SODA PRICES

The Barrett Company has announced there will be no change in the price for Arcadian, the American nitrate of soda, in bulk for the period July 1 to December 31, 1941, despite present world conditions and a greatly increased demand for nitrogen products. The price is $27.00 per ton, f.o.b. cars Hopewell, Virginia, and usual U. S. Atlantic and Gulf ports.

Arcadian, the American Nitrate of soda, is produced at Hopewell, Virginia, the largest nitrate of soda plant in the world, and a vital factor in supplying the nitrogen needs of agriculture and industry under the national defense program.

NORTH CAROLINA ISSUES FERTILIZER BULLETIN

North Carolina's annual bulletin on "Analyses of Commercial Fertilizers. Spring Season of 1940," containing 246 pages of information to guide farmers in more intelligent use and purchase of plant food, is now off the press and will be sent free to growers upon request, D. S. Coltrane, assistant to the Commissioner of Agriculture, has announced.

A publication of the State Department of Agriculture, the Fertilizer bulletin contains information on fertilizer inspection, lime and land-plaster analyses, valuation of all fertilizers, "guaranteed and found in dollars per ton," consumption statistics, grades for which there has been greatest demand.

Articles written to assist the growers in more intelligent use of fertilizer, prepared by State College, N. C. Experiment Station and Department authorities include:

Fertilizers for Different N. C. Crops; Fertilization of Truck Crops; A Discussion of Tobacco Fertilizers; Fertilization of Peanuts; Fertilizer Suggestions for Corn; Results from Fertilizer Placement; American Potash Supplies; Soil Testing and Plant Growth; Soil Acidity Problems in the Southeastern States; Soil Acidity and the Use of Lime; Different forms of Agricultural Lime and Their Uses; Definitions of Fertilizer Terms; Recommended Field and Vegetable Crop varieties for North Carolina.

New features of the bulletin include the use of plus and minus signs to indicate "shortage" or "overage" in plant food guaranteed by the manufacturer, Coltrane explained.

Commercial Value of Soilless Culture Now Being Determined

By C. Y. Arnold, Idaho Agricultural Experiment Station, Moscow, Idaho

Soilless culture, or the production of crops in chemical solutions, shows definite promise in the production of greenhouse crops. Its capacity to produce a high yield of a high quality crop at a lower cost gives it a definite advantage over soil culture. Among its disadvantages are included the specialized training necessary for its successful operation and the cost of equipment. The latter of these two will discourage its outdoor use except under special conditions.

Old, Old Practice

For some 80 years, soilless culture has been used as an indispensable tool in the hands of the plant scientist. As such, it aroused no interest in the public. But when, in 1928 it was launched on a commercial career, the University of California alone received about 30,000 letters inquiring about it. Amidst this enthusiasm the true value of soilless culture was lost in a maze of exaggerations and propaganda. Hence, it has been the self-appointed task of several experiment stations and universities over the country to ferret out its true commercial value.

On the basis of their research of the past 10 years the following statements may be made: (1) The yields of crops grown without soil are as high or higher than those of crops grown in soil under the same conditions; (2) The quality of such crops falls in the same class—it is as good or better; (3) By eliminating such things as manual watering, the spreading of fertilizers, cultivation and mulching, it has reduced labor costs; (4) It will reduce the cost of sterilization, (5) Its successful operation requires a fundmental knowledge of chemistry and plant physiology, (6) The cost of equipment is high but not prohibitive in the greenhouse; (7) Many difficulties involved in its operation are still unsolved.

Commercial Application

Commercial application has become more widely accepted in the East than in the Pacific Northwest. Several greenhouse concerns located in the East have been trying it out on a small scale. Most of them have been large concerns and the majority have been commercial florists. Turner, in Illinois, has 65,000 square feet of greenhouse space devoted to

(Continued on page 24)

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Principal Articles in This Issue

U. S. Interior Department Reports Adequate Fertilizer Resources

The United States, within the next few years, could readily be independent of all foreign sources of minerals required to manufacture artificial fertilizers essential in an emergency to the domestic production of adequate supplies of food, according to a report just submitted by Dr. R. R. Sayers, Director of the Bureau of Mines, to Secretary of the Interior Harold L. Ickes.

Of the three principal elements vital for plant growth and therefore indispensable for national defense, the Bureau's report shows, phosphorus is now available in this country in sufficient quantities to meet all current or projected needs; potassium is expected soon to reach a level which will make the United States self-sufficient in that respect; and nitrogen can be produced in sufficient quantity by an increase in domestic plant capacity, some of which is now taking place.

In many parts of the country, says the Bureau of Mines, production of food is absolutely dependent upon the use of artificial fertilizers. More than 60 million of the 360 million acres of land cropped annually require the use of fertilizer every year.

Domestic consumption of commercial fertilizers during the past 30 years, according to the report, has fluctuated between 4 million and 8 million tons annually, the average being about 6 million tons. Current consumption, however, is above the average, and in the near future America's farms are expected to demand between 7 and 9 million tons a year.

Present capacity for fertilizer production, states the report of the Bureau of Mines, is over 16 million tons, or twice as much as the consumption of any past year, and appears adequate to meet any demand likely to arise during the next few years.

Although more than a score of elements are deemed necessary for plant growth, only phosphorus, potassium, and nitrogen are regularly applied in large amounts and need be considered vital in the present emergency.

Phosphate rock is the source of phosphorus used in commercial fertilizers. Our reserves of this commodity are virtually unlimited, sufficient at the present rate of consumption for at least 3,000 years. There is no question of the adequacy of our supply under any circumstances, says the Bureau of Mines. Vast areas of phosphate and potash deposits in the United States are administered by the General Land Office, also in the Department of the Interior.

Domestic resources of potash salts are more than adequate for our own use for hundreds of years—the annual productive capacity of American plants is in excess of current domestic demands, and in 1939 domestic potash sales (K_2O) were 96 per cent of the apparent domestic consumption. The leading potash-bearing raw material used in American fertilizers is potassium chloride. Domestic refinery capacity in 1940 was not sufficient to meet all our requirements for 60 per cent chloride, but mining capacity was great enough to supply the balance as 25 per cent salts. Additional new production is expected in 1941. Two producers are now making potassium sulphate from the chloride, and a third is obtaining it and also potassium-magnesium sulphate from langbeinite, a natural sulphate of potassium and magnesium. An ample supply of these sulphates, hitherto imported, is expected in 1941.

The United States has never produced more than 75 per cent of its apparent consumption of nitrogen, although domestic production capacity apparently has slightly exceeded domestic needs. The balance of the consumption has been supplied largely by Chilean nitrate. Some additions to plant capacity are now being made, but continued flow of Chilean nitrate may be necessary to care for all demands.

Obituary

JOHN W. FRY

Another pioneer has been lost to the industry in the death of John W. Fry, of Columbia, Tenn. Mr. Fry was one of the organizers of the International Agricultural Corporation and its first secretary, serving until 1913. He also helped organize the Consolidated Phosphate Co. which operated in the Tennessee field.

At the time when phosphate was discovered in Tennessee, in 1896, Mr. Fry was president of the Farmers and Mechanics Bank of Columbia and continued his interest in and connection with the phosphate industry for the rest of his life. For the past several years, poor health has kept him from active participation in business affairs.

He is survived by two sons, J. Carlton Fry and William Fry, and by three daughters, Miss Grace Fry, Mrs. Brown Taylor and Mrs. Samuel Harlan.

NO CHANGE IN NITROGEN SOLUTION PRICE

The Barrett Company has announced there will be no change in price for Barrett Standard Nitrogen Solutions for the new fertilizer year beginning July 1, 1941. Notwithstanding a greatly increased demand, the price will remain at $121.58 per ton of 2,000 lb. nitrogen (total), f.o.b. cars Hopewell, Virginia, and usual Atlantic and Gulf ports.

Nitrogen solutions are produced at Hopewell, Virginia, whose production of nitrogen products plays an important part in supplying the needs of agriculture and industry.

LINK-BELT INTRODUCES NEW RUBBER-TREAD BELT IDLER

Following closely on the heels of the announcement of a new Link-Belt rubber-tread return run idler for belt conveyors, Link-Belt Company, Indianapolis, now announces a new, troughing type rubber-tread impact idler designed to absorb the shock of receiving heavy, lumpy, rough materials at the loading point.

It is pointed out that the cushioning effect of the rubber-to-rubber contact between belt and idler will prevent cutting, bruising, scuffing of belt; and protect the bearings and framework from shock, thus prolonging the life of

both the belt and the idler. Other features claimed for the new idler are—1, less breakage of fragile material such as coke, friable coal, etc.; 2, cleans the belt and prevents building up of material; 3, withstands corrosion and abrasion.

Molded rubber-tread rolls, 6-in. diameter, are firmly secured to a Friction Fighter roller-bearing-equipped tube by set screws through malleable iron spacers which clamp over reinforced rubber hubs. These rolls are said to cushion even the heaviest blows.

The new idlers are available for belt widths of 14 to 60 inches. Larger diameter rolls can also be supplied, as well as rubber-tread impact rolls for flat-belt conveyor idlers.

Further data will be found in a new Link-Belt Folder No. 1793, sent to any interested reader on request.

SUPPLEMENT TO BIBLIOGRAPHY ON MINOR ELEMENTS

The Chilean Nitrate Educational Bureau has recently issued a second supplement to the third edition of their published compilation "Bibliography of References to the Literature on the Minor Elements." This third edition was published in February, 1939, and in April, 1940, a supplement was issued covering literature published in the interim. The second supplement, just off press, brings the subject up to date.

This pamphlet of 68 pages lists references to 49 of the minor elements and the effects of their use on over a hundred different crops, flowers, trees, etc.

Both the original bibliography and the supplement are thoroughly indexed by both subjects and authors.

FARLEY JOINS I. A. C. STAFF

The International Agricultural Corporation has announced the appointment of Franklin Farley to the position of General Manager of the Phosphate Division. Mr. Farley will succeed John T. Burrows, vice president, who will now be able to give his entire attention to the activities of the company's potash division.

Mr. Farley is well known in the phosphate industry, having been associated for the past 18 years in an executive capacity with the Phosphate Mining Company.

POTASH DELIVERIES INCREASE

The American Potash Institute, Inc., announces that deliveries of agricultural potash by the four major producing Companies within the continental United States, Canada, Cuba, Puerto Rico, and Hawaii during the first quarter of the calendar year 1941 amounted to 107,848 tons of actual K_2O, equivalent to 192,504 tons of potash salts. This represents an increase of 53 per cent over deliveries during the same months of 1940. Constituting this total were 163,050 tons of muriate, 9,978 tons of manure salts, and 19,476 tons of sulphate. In addition, deliveries for chemical uses amounted to 14,503 tons of salts equivalent to 8,992 tons of K_2O. These figures include salts of domestic origin only. Based on import records of the Bureau of Foreign and Domestic Commerce, potash imports in the form of chloride and sulphate salts during the first quarter amounted to approximately 11 short tons K_2O.

In terms of regional consignments, the total of 99.942 tons K_2O delivered within the continental United States was shipped as follows: Southern states (including Virginia) 54,794 tons; Mid-Western states 21,963 tons; Northeastern and Mid-Atlantic states 20,666 tons; and West Coast states 2,519 tons. The balance of 7,906 tons K_2O was delivered to Canada, Cuba, Puerto Rico and Hawaii.

Potash Deliveries

Short Tons K_2O

(United States, Canada, Cuba, Hawaii, Puerto Rico)

	Jan.-March, 1941	Jan-March, 1940
Muriate	95,908	66,136
Manure salts	2,838	1,095
Sulphate	8,393	3,231
Sulphate-potash-magnesium	709	
Total agricultural	107,848	70,462
Chemical potash	8,992	8,450
Grand Total	116,840	78,912
Northeast-Middle Atlantic States	20,666	13,089
Southern (including Virginia)	54,794	34,584
Mid-Western	21,963	13,081
West Coast	2,519	2,333
Canada, Puerto Rico, Cuba, Hawaii	7,906	7,375
Total Agricultural	107,848	70,462

FERTILIZER MATERIALS MARKET

NEW YORK

Mixed Goods Season Slowing Up and Interest in Materials Lags. New Prices on Potash, Nitrate of Soda, and Nitrogen Solutions Show Little Change. Sulphate of Ammonia Prices to be Announced Shortly

Exclusive Correspondence to "The American Fertilizer."

NEW YORK, May 22, 1941.

The mixed goods business has continued to slow up and naturally the demand for raw materials has slackened at the same time, which is natural at this time of the year.

The important happenings in the last few days have been, first of all, the announcement by several of the larger potash producers' prices for the new season; secondly, announcement of nitrate of soda prices and also prices announced for nitrogen solutions.

Potash

For high-grade potash the schedule price is the same as last year, with the difference that for full discount of 12 per cent orders must be placed prior to June 30th and deliveries for full discount taken by January 31, 1942. No discount is specified for orders placed later, nor for deliveries after January 31, 1942.

For muriate of potash, minimum 50 per cent K_2O, the unit price has increased to 56 cents per unit K_2O, on the new schedule, all discounts and conditions same as for the high-grade material.

Nitrate of Soda

Nitrate of soda price for deliveries through December of this year on the new schedule is the same as last, that is, $27.00, bulk basis, f.o.b. ports.

Nitrogen Solutions

Nitrogen solutions for the new fertilizer year ending June 30th, 1942 are scheduled same as present season—this price figuring $121.58 per ton of nitrogen, equivalent to $100.00 per ton of ammonia, which means that this price for nitrogen solutions is equivalent to $25.00 per ton of sulphate of ammonia, in bulk.

No new prices for B Liquor have been announced as yet.

Sulphate of Ammonia

New prices for sulphate of ammonia have not yet been released, but it has been intimated that in the new season prices will start at the present contract price, with an increase of $1.00 per ton for delivery the second 6 months of the fertilizer year.

BALTIMORE

Spring Season Ending with Favorable Tonnage Figures. Feed Ammoniates Lower. Higher Prices Expected in Some Materials.

Exclusive Correspondence to "The American Fertilizer."

BALTIMORE, May 20, 1941.

The spring shipping season is now rapidly drawing to a close, due to the unseasonable warm and dry weather during the past six weeks. The tonnage, however, compared very favorably with previous year, and in some cases manufacturers made an increase. However, there was practically no short buying in materials, which, with the exception of ammoniates suitable for feed, are all ruling firm.

Ammoniates.—The market on tankage suitable for feeding purposes is slightly easier, and freely quoted at around $3.75 per unit of nitrogen and 10 cents per unit of B.P.L., f.o.b. basis Baltimore. South American ground dried blood for shipment is obtainable at about $3.70 per unit of nitrogen, c.i.f. Baltimore.

Nitrogenous Material.—The market on this product continues unchanged and is nominally quoted at $2.75 per unit of nitrogen, f.o.b. Baltimore.

Sulphate of Ammonia.—There has been practically no demand for re-sale, and on account of the difficulty of securing export license, there were no recent export sales noted. All manufacturers are anticipating a higher market when prices for another season are announced.

Nitrate of Soda.—Deliveries in this section have now reached their peak and withdrawals are seasonably less. The market is unchanged at $29.40 per ton of 2,000 lb., in 100-lb. bags and will prevail until the end of next month. On account of higher freight rates and increased handling cost, it would not be surprising to see a higher schedule for another season.

Fish Scrap.—The market on unground menhaden fish is out of line with the general ammoniate market, and while there have been limited sales at the equivalent of $5.40 per unit of nitrogen and 10 cents per unit of B.P.L., f.o.b. fish factories, the tonnage booked is much less than is usual at this time of the year. Should the catch be good this year, there is no question but what lower prices will prevail, and most of the important buyers are holding off awaiting further developments.

Superphosphate.—Up to the present time there has been no change in the market, but it will be only a question of time before manufacturers will be compelled to advance their prices on account of the heavily increased ocean freights, as well as labor and general manufacturing costs. The present market, subject to change without notice, is $8.00 per ton of 2,000 lb., basis 16 per cent for run-of-pile, and $8.50 for flat 16 per cent grade, no charge for overage, both in bulk, f.o.b. producers' works, Baltimore.

Bone Meal.—Both raw and steamed bone meal are in short supply, and while, of course, the consumption has been materially reduced on account of the comparative high prices prevailing on bone products, a scarcity is developing due to cessation of shipments from Europe and difficulty in securing freight room from South America. 3 and 50 per cent steamed bone is nominally quoted at $37.00 per ton, while 4½ and 47 per cent raw bone meal is priced at $32.50 to $36.00 per ton, f.o.b. Baltimore.

Potash.—There is no change in the situation, and there has been practically no resale demand, as producers were able to take care of domestic consumption. Prices for another season are not expected until next month, and there is considerable speculation as to what the new figures will be, although it has been intimated there will be no heavy advances.

Bags.—The burlap situation is still critical but with the end of the season in sight, the market has eased off to about $180.00 per thousand, basis 40 cut 54 in., 10 oz., but there is very little new business being booked. It is anticipated that when shipments now en route start arriving, a lower market will prevail.

ATLANTA

Mixed Fertilizer Shipments About Finished. Good Tonnage Reported. Potash Prices for Next Season Announced.

Exclusive Correspondence to "The American Fertilizer."

ATLANTA, May 19, 1941.

The middle of May sees the spring fertilizer season about over as far as shipments and deliveries of mixed fertilizers are concerned. The top dresser season is now in progress and will run for about six weeks throughout the southeastern part of the country. The demand for nitrate of soda for this purpose should be good and, based on tonnage figures to date, the consumption will be fully up to last year if not in excess of 1940 takings.

Potash prices for the coming year have been issued with 60 per cent muriate at 53½ cents the ports and 50 per cent muriate at 55 cents, these prices being subject to the usual discount. With foreign potash out of the picture and coastwise shipping being commandeered by the Government, the question now is, will

there be enough domestic potash to go around?

The markets generally are practically unchanged. We quote as follows:

South American Blood.—$3.25 ($3.95 per unit N), c.i.f.

Tankage.—$3.40 ($4.13½ per unit N) and 10 cents, c.i.f.

Domestic Nitrogenous.—$1.90 ($2.31 per unit N), f.o.b. western producing points.

Fish Materials.—Still scarce.

Sulphate of Ammonia.—Somewhat easier but with no surplus in sight.

Nitrate of Soda.—Demand excellent. Prices unchanged.

Cottonseed Meal.—Prime 8 per cent, $25.00 basis Memphis; southeastern mills, $1.00 to $1.50 per ton higher.

CHARLESTON

Nitrate of Soda Shipments Increasing. Small Carryover in Superphosphate. Domestic Organics Higher.

Exclusive Correspondence to "The American Fertilizer."

CHARLESTON, May 19, 1941.

Nitrate of soda has now begun to move in heavier volume and if the southeast can get plentiful rains, this movement will become quite heavy in the next two weeks.

The potash prices have now come out and are very much the same as last season, except that 50 per cent muriate has advanced 1½ cents.

Nitrogenous.—Domestic can be obtained around $1.80 ($2.19 per unit N) to $1.90 ($2.31 per unit N), f.o.b. mid-western points.

Blood.—Around $3.30 ($4.01 per unit N), bulk Chicago; South American, around $3.15 to $3.20 ($3.83 to $3.89 per unit N), c.i.f. Atlantic ports, where freight can be obtained.

Fish Meal.—Menhaden meal at $61.50 to $62.00 per ton, f.o.b. Baltimore. No quotations on sardine meal.

Cottonseed Meal.—Around $25.00 for 8 per cent at Memphis and $29.00 for 8 per cent at Atlanta.

Superphosphate.—This continues scarce and it is evident that the carry over in the southeast will be less than it has been in several years.

TENNESSEE PHOSPHATE

Construction Work Proceeding Rapidly. Changes Being Made in Methods of Operation. Shipments Continue in Quantity.

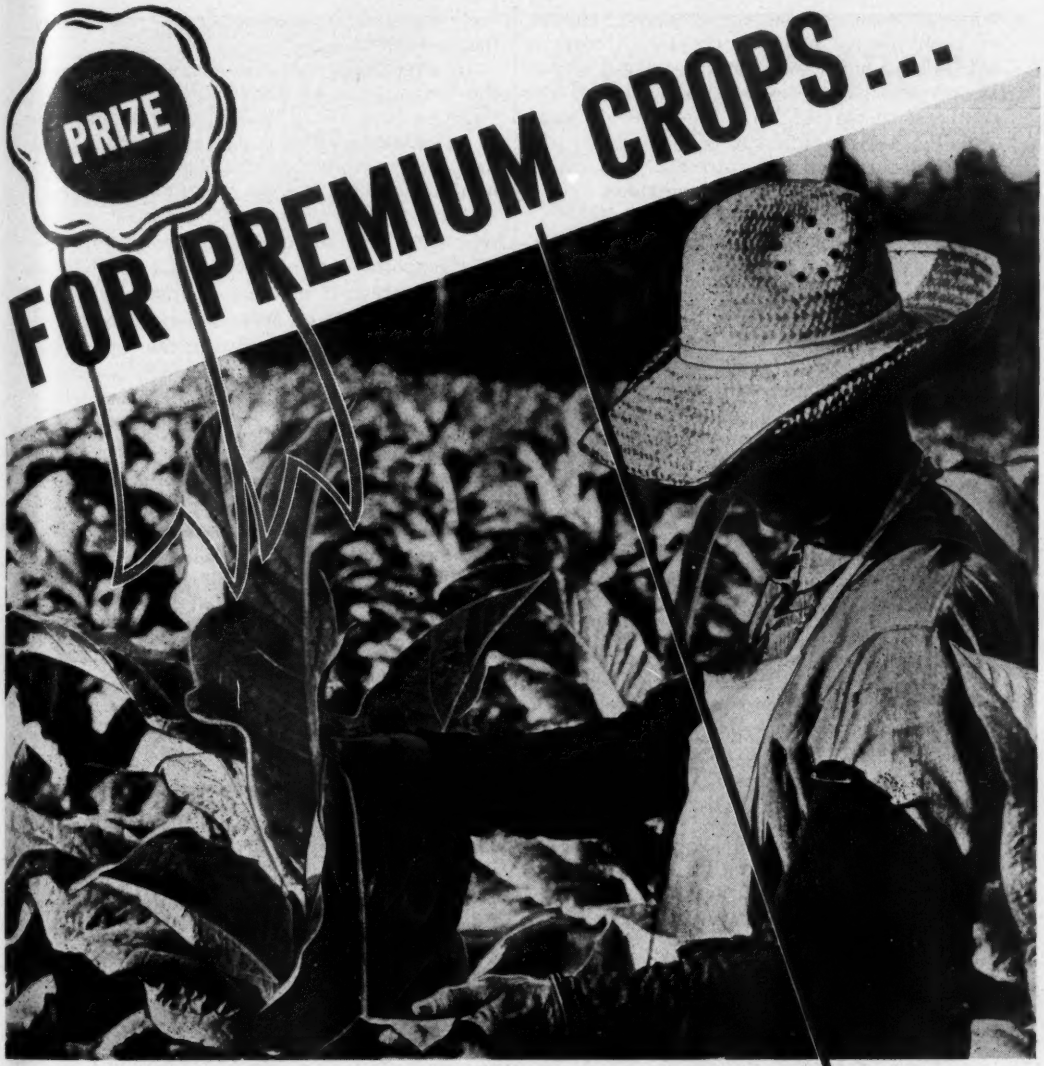
Exclusive Correspondence to "The American Fertilizer."

COLUMBIA, TENN., May 18, 1941.

Weather conditions in the phosphate field have been ideal for rapid prosecution of all the construction work under way at the several TVA plants. The phosphate will be mined and washed, and then pumped several miles to the sintering plant on the railroad; likewise at the Hoover & Mason plant near Mt. Pleasant, where the entire intake part of the plant is being changed from the old blast furnace skip type to a long pit into which the mine cars will discharge and out of which scrapers will feed to an inclined drag scraper conveyor to the emulsifiers and rolls.

At the same time, shipments have continued with unusual vigor to all consuming channels and especially to the farmers for direct application. Tonnage in that line has exceeded so far in 1941 by 25 per cent, the largest previous shipment during the same calendar period in the history of the field.

Mining with dragline shovels and transporting by trucks, the International Agricultural Corporation is still actively working its deposits in the Southport area near where the TVA mined on the Wheeler leases for several years. The material is transported in crude



USE PLENTY OF SUNSHINE STATE POTASH

● Balanced fertilizers are economical fertilizers. In the case of tobacco, for instance, results definitely prove that considerably more potash than has been applied in the past, can profitably be used to further increase acre values. Potash has a greater influence on quality than any other element in tobacco fertilizer and pays highest dividends to the tobacco grower. Adequate amounts of potash produce a smooth, even leaf of good burning quality which commands a relatively high market value.

Progressive fertilizer producers know it's good business to provide growers of tobacco and all major crops with complete fertilizers containing plenty of potash, compounded to fit the recommendations of local agricultural authorities. They also know that Sunshine State Potash can be relied upon for consistently uniform analysis and careful sizing which makes handling and blending easy.

HIGRADE MURIATE OF POTASH
62/63% K_2O
Also 50% K_2O Grade
MANURE SALTS
Approximately 30% K_2O

SUNSHINE STATE POTASH
A PRODUCT OF NEW MEXICO U.S.A.
REG. U. S. PAT. OFF.

UNITED STATES POTASH COMPANY, INC., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

form as it comes from the ground a distance of about twelve miles to the I.A.C. plant a few miles south of Mt. Pleasant. Some special streets are having to be built through the southeastern part of Mt. Pleasant to do away with the heavy traffic caused by these trucks through the principal streets, as several hundred loads per day are being hauled.

CHICAGO

Fertilizer Organics Market Quiet with Higher Prices Being Asked. Feed Market Spotty.

Exclusive Correspondence to "The American Fertilizer."

CHICAGO, May 19, 1941.

While some trading in organics has occurred, the market is quiet at present, and some producers have temporarily withdrawn all offerings. A sale of fertilizer tankage at comparatively high price is reported, and at present there is but little of this material offering.

In the feed market, demand is now spotty and an easiness is noted, notwithstanding, supplies are not heavy.

Nominal prices are as follows: High grade ground fertilizer tankage, $2.50 to $2.75 ($3.04 to $3.34½ per unit N) and 10 cents; standard grades, crushed feeding tankage, $3.50 to $3.60 ($4.25½ to $4.37½ per unit N) and 10 cents; blood, $3.15 to $3.25 ($3.83 to $3.95 per unit N); dry rendered tankage, 72½ to 75 cents per unit of protein, Chicago basis.

PRICE ON 50% MURIATE OF POTASH ADVANCED

On May 22nd, the Potash Company of America issued a supplement to their previously published price list, advancing the price of 50% muriate of potash to 58 cents per unit K_2O. There was no change in the price of high grade 60% muriate or of run-of-mine manure salts.

In explaining the reason for the increase, the company made the following statement: "The trade is aware of the fact that in order to manufacture 50% muriate it is necessary, first, to manufacture the high grade 60% muriate and then dilute that to the lower grade material. This is uneconomic under present emergency conditions. Furthermore, in view of the shortage of cargo space, it is advisable in the interest of national defense to discourage the shipment of 50% material when 20% more potash can be handled in the same space by the use of 60% material, which is equally, if not more, desirable in the manufacture of fertilizer. This is also true in the case of all-rail shipments."

CLASSIFIED ADVERTISEMENTS

Advertisements for sale of plants, machinery, etc., and for help and employment, in this column, same type as now used, 60 cents per line, each insertion.

HELP WANTED

WANTED—Man experienced inside, brokerage and commission business. Gentile preferred. State fully qualifications, and remuneration expected. Address "490," care THE AMERICAN FERTILIZER.

POSITION WANTED

POSITION WANTED: Perhaps, due to the National Defense Program, you may need an experienced factory man above the draft age. I have had a lot of experience in this work for the past sixteen years. Can furnish good references and record of performance. Am now employed but for personal reasons desire to make a change at this time. Address "495" Care THE AMERICAN FERTILIZER, Philadelphia.

Fertilizers for Watermelons*

The watermelon has contributed to man's pleasure since the days of Sanskrit when natives of tropical Africa made long journeys to enjoy its luscious fruit. (Many U. S. growers will testify that similar "journeys" are still popular.) Average yearly consumption today in the United States is about 28.5 pounds per person. Watermelons are grown in every state but production of shipping melons is concentrated in the South, with Georgia, Texas, Florida, South Carolina and California leading in acreage.

Warm southern climate and light, well-drained upland soils form an ideal combination for watermelons in the Coastal Plain area. The sandy texture of these soils and their favorable water-relationship make it fairly simple to prepare a good seed bed. Their one disadvantage is low natural fertility. Economical crop production is possible only through regular application of fertilizer.

At the Georgia Coastal Plain Experiment Station, the Department of Horticulture has conducted a 6-year series of tests to find the answers to several watermelon problems. A breeding program is under way to improve flavor and increase wilt resistance.

Tests with fertilizer include a comparison of different materials and a study of the effect of side dressing. The work on major plant food elements may be summarized as follows:

Phosphorus. Quite deficient in these soils, Comparisons of various phosphorus carriers are under way but must be carried on still further before conclusions may be drawn.

Potash. Very important. From a source standpoint, muriate has been found preferable. A light side-dressing at first cultivation seems to be profitable.

Nitrogen. Since nitrogen is the limiting factor and the most expensive plant food element on most upland soils, special pains were taken to compare the various nitrogen carriers, singly and in combination.

Seven single sources of nitrogen were compared over a period of five years. The results showed little differences in net income per acre, with the exception of tankage, which produced approximately $11.00 higher net income than the standard mineral source and about $5.50 per acre more than the best mineral source.

Side-dressing with a small amount of nitrate of soda, especially in conjunction with potash, seems to be a profitable practice under conditions similar to those of the test.

Since 1933, mineral and organic nitrogen derived from several standard materials have been tested in various ratios. The greatest number of marketable melons per acre (619) was obtained when the nitrogen was derived in equal parts from two water-soluble minerals and from two water-insoluble organic sources. Net income per acre, produced by this mixture, was $18.80 higher than that produced by mineral nitrogen alone.

As with other crops, the deciding factor in making a selection among various carriers of a plant food element is not price-per-unit, but income-per-acre, which is the real key to profitable crop production.

The following table was adapted from Table 71 of the 19th Annual Report of the Georgia Coastal Plain Experiment Station.

*From the Organic News Letter, published by the Organic Nitrogen Institute.

Influence of Source of Nitrogen on Production of Watermelons

Location: Tifton, Georgia. Period: 1933-1938.

Source of Nitrogen	Equivalent Acidity per Unit of N	Cost of N per Acre	Number of Melons per Acre	Change in Net Income per Acre
Mineral N only	36 B	$2.21	457	.....
Mineral N ⅔				
Organic N ⅓	15 B	3.78	539	+ $8.63
Mineral N ½				
Organic N ½	28 A	3.61	619	+ 18.80
Mineral N ⅓				
Organic N ⅔	7 A	4.20	601	+ 16.01
Organic N only	28 A	5.20	523	+ 5.31

See Page 4

VICE PRESIDENT PRESENTED CHEMISTS' MEDAL TO KNIGHT

On behalf of the American Institute of Chemists, Vice-President Wallace presented a medal on May 17th to Dr. Henry G. Knight, Chief of the Department of Agriculture's Bureau of Agricultural Chemistry and Engineering. The occasion was the annual dinner of the Institute, held at the Wardman Park Hotel, Washington, D. C. The Vice President made the presentation because of his interest in improving agriculture and expanding uses for agricultural commodities and his years of association with Doctor Knight in the Department of Agriculture.

Doctor Knight is the second Government scientist to be awarded the Institute's medal. Dr. William Blum of the U. S. Bureau of Standards was awarded the first medal in 1926. Since then the honor has been conferred on thirteen men and one woman "for noteworthy and outstanding service to the science of chemistry or the profession of the chemist in America."

COMMERCIAL VALUE OF SOILLESS CULTURE NOW BEING DETERMINED

(Continued from page 11)

soilless culture and plans to expand. Amlings, of Chicago, have over 10,000 square feet, and George J. Ball, Inc., has 12,000. There are several more.

Plants grown originally by this system were supported on a wire mesh screen over a chemical solution into which the roots grew directly. This method is being superseded in the East by the so-called gravel culture system. With this method, the plants are grown in a waterproof bench filled with some material such as gravel. The gravel is flooded from one to five times per day depending on the water requirements of the plants. It is pumped up from a tank located underneath the bench. As soon as the gravel is flooded the solution is allowed to drain back into the tank. Gravel culture provides at a somewhat higher initial cost, a safer, more natural medium of plant growth, with good aeration, and a water supply fitted to the plants daily needs. Progress in its commercial application has been slow and will continue to be so. It is estimated that it will be 10 or 15 years before it is generally accepted in the greenhouse industry. True, it has its advantages, but they are not great enough to warrant a wholesale change from soil culture. Where growers are achieving success with present methods and are not having troubles arising from soil conditions, such a change is not being encouraged at the present.

NEW PEAK IN 1940 FERTILIZER

(Continued from page 6)

Fertilizer is relatively one of the lowest priced commodities that the farmer buys. The U. S. Department of Agriculture index of the price paid by farmers for fertilizer is only 96 (1910-1914 = 100) while the index of prices paid for all commodities bought by farmers is 124.

Reflecting in large part the reduction in cotton acreage in the South, there has been a reduction in fertilizer consumption in that region, a reduction which has been counterbalanced by increases in other geographic sections. In New England also there has been a falling off in tonnage, but this has been due in part to the shift in Maine to high analysis goods, with a consequent decline in gross tonnage.

Significant changes in fertilizer sales by geographic regions are brought out by the table on page 6. In the Middle Atlantic States, in the Midwest, and in the Far West the use of chemical plant food is on the upgrade.

North Carolina still remains far in the lead in tonnage used. One out of every eight tons of fertilizer used last year was applied to North Carolina soils. The Carolinas, Georgia, Florida, and Alabama combined accounted for 47 per cent of total 1940 tonnage.

ANTI-TRUST FERTILIZER TRIALS SET FOR 1942

(Continued from page 5)

the demands of the farmer and other production vital to national defense," Charles J. Brand, executive secretary and treasurer of the National Fertilizer Association, said here today in commenting on the government's fertilizer anti-trust suit.

"The government's enlarged program for more corn, hogs and vegetables is making added demands upon the industry. And not

only that but basic requirements for the manufacture of munitions such as nitrogen carriers and sulphuric acid are part of the industry's contribution to national defense."

"Fertilizer profits are and have been extremely low," said Brand. "In the last ten years, based on income tax returns, the fertilizer companies on the average made a profit of a little more than 1 cent for each dollar they took in. A recent securities and exchange commission report shows that in 1939 net profits of six large fertilizer companies amounted to only 2.04 per cent of sales while the ratio for sixteen large chemical companies was 20.5 per cent.

Government in Manufacture

"In the face of this low-profit situation and war emergency demands upon us the industry is now confronted by increased activity on the part of the Government itself in the manufacture of fertilizers, a shortage of regular shipping facilities, which is increasing the cost of raw materials, and last but certainly not least, by a Department of Justice suit in the courts.

"This action, which implies no moral turpitude according to Thurman Arnold, is designed, no doubt, as one of the many parts of the Government program to control prices. Nevertheless, it comes as an uncalled-for shock to the 764 competing companies engaged in the manufacture of fertilizer. The industry has built up production, increased plant food content 57 per cent, with tonnage increased only 24 per cent, and delivered this improved commodity to two million American farmers at a price less than they paid for fertilizer in the 1910-14 period while, according to the Department of Agriculture, the farmers pay 23 per cent more for all other commodities they buy.

"What these low prices have meant to the farmer is further emphasized by the testimony of 32,000 farmers who reported a return of $3.60 for each dollar which they spent for fertilizer."

Pleas Entered

Pleas were entered as follows:

Nolo contendere—Superphosphate Association, Inc.; Acme Fertilizer Company; Anderson Fertilizer Company; Cotton States Fertilizer Company; Empire State Chemical Company; Etiwan Fertilizer Company; Georgia Fertilizer Company; Maybank Fertilizer Company; Merchants Fertilizer Company; Mutual Fertilizer Company; Pelham Phosphate Company; Planters Fertilizer and Phosphate Company; Reliance Fertilizer Company; Southern Fertilizer and Chemical Company; C. B. Clay; Charles Ellis, Sr.; J. Lee Etheredge; J. Ross Hanahan; E. R. Hodgson; Ashmead F. Pringle, Sr.; Bachman Smith; A. Douglas Strobhar; Thomas E. Wright.

Not guilty—National Fertilizer Association, Inc.; Charles J. Brand; The American Agricultural Chemical Company; Armour and Company (of Delaware); Armour Fertilizer Works; The Baugh and Sons Company; The Baugh Chemical Company; Baugh and Sons Company of Ohio; The Davison Chemical Corporation; International Agricultural Corporation; F. S. Royster Guano Corporation; Swift and Company; Virginia-Carolina Chemical Corporation; Consolidated Rendering Company; Federal Chemical Company, Inc.; Naco Fertilizer Company; Robertson Chemical Corporation; Smith-Douglass Company, Inc.; The Smith Agricultural Chemical Company; The Southern Cotton Oil Company; Standard Wholesale Phosphate and Acid Works, Inc.; Tennessee Corporation; Wilson and Toomer Fertilizer Company.

Apothecaries Hall Company, Inc.; Blount Fertilizer Company; The Buhner Fertilizer Company, Inc.; Capital Fertilizer Company; Central Chemical Corporation of Maryland; The Diamond Fertilizer Company; Farmers Cotton Oil Company; The Farmers Fertilizer Company; Farmville Oil and Fertilizer Company; Griffith and Boyd Company of Baltimore City; The Gulf Fertilizer Company; Hartsville Fertilizer Company; Kelley, Weber and Company, Inc.; Knoxville Fertilizer Company; Long Island Produce and Fertilizer Company, Inc.; Marshall Cotton Oil Company; Meridian Fertilizer Factory; North American Fertilizer Company; Olds and Whipple, Inc.

Pacific Guano Company; Price Chemical Company, Inc.; Charles W. Priddy Company, Inc.; E. Rauh and Sons Fertilizer Company; Reliance Fertilizer and Lime Corporation; Richmond Guano Company; The Rogers and Hubbard Company, Inc.; Shreveport Fertilizer Works; Southern Agricultural Chemical Corporation; The Summers Fertilizer Company, Inc.; I. P. Thomas and Son Company; F. W. Tunnell and Company, Inc.; Worcester Fertilizer Company; Harold F. Ayer; Harry B. Baylor; Charles F. Burroughs; Milton A. Caine; Louis H. Carter; Ralph B. Douglass.

W. C. Geoghegan; William J. Gray; M. R. Hallman; Chester F. Hockley; Joseph A. Howell; A. Lynn Ivey; Henry S. Parson; A. Quistgaard Petersen; Mack S. Purvis; M. C. Roop; Loren W. Rowell; Walter F. Rupp; John E. Sanford; Oscar F. Smith; Archie F. Stock; E. H. Westlake; George A. Whiting; Julian Y. Williams; W. T. Wright.

Nol pros—Arkansas Fertilizer Company; John F. Maybank.

BUYERS' GUIDE

A CLASSIFIED INDEX TO ALL THE ADVERTISERS IN "THE AMERICAN FERTILIZER"

This list contains representative concerns in the Commercial Fertilizer Industry, Including fertilizer manufacturers, machinery and equipment manufacturers, dealers in and manufacturers of commercial fertilizer materials and supplies, brokers, chemists, etc.
For Alphabetical List of Advertisers, see page 33.

ACID BRICK
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

ACID EGGS
Chemical Construction Corp., New York City.

ACIDULATING UNITS
Chemical Construction Corp., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMO-PHOS
American Cyanamid Co., New York City.

AMMONIA—Anhydrous
Barrett Company, The, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA LIQUOR
Barrett Company, The, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.

AMMONIA OXIDATION UNITS
Chemical Construction Corp., New York City.

AMMONIATING EQUIPMENT
Sackett & Sons Co., The A. J., Baltimore, Md.

AMMONIUM NITRATE SOLUTIONS
Barrett Company, The, New York City

AUTOMATIC ELEVATOR TAKEUPS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BABBITT
Sackett & Sons Co., The A. J., Baltimore, Md.

BAGS AND BAGGING—Manufacturers
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Paper
Bagpak, Inc., New York City.
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS (Waterproof)—Manufacturers
Bemis Bro. Bag Co., St. Louis, Mo.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BAGGING MACHINES—For Filling Sacks
Atlanta Utility Works, East Point, Ga.
Bagpak, Inc., New York City.
Sackett & Sons Co., The A. J., Baltimore, Md.

BAG FILERS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.

BEARINGS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

BELT LACING
Sackett & Sons Co., The A. J., Baltimore, Md.

BELTING—Chain
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

BELTING—Leather, Rubber, Canvas
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

BOILERS—Steam
Atlanta Utility Works, East Point, Ga.

BONE BLACK
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Huber & Company, New York City.

BONE PRODUCTS
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

BORAX AND BORIC ACID
American Potash and Chem. Corp., New York City.
Pacific Coast Borax Co., New York City.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Keim, Samuel L., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

BUCKETS—Elevator
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

A Classified Index to Advertisers in "The American Fertilizer"

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BUCKETS—For Hoists, Cranes, etc., Clam Shell, Orange Peel, Drag line, Special; Electrically Operated and Multi Power
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

BURNERS—Sulphur
Chemical Construction Corp., New York City.

BURNERS—Oil
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CABLEWAYS
Hayward Company, The, New York City.

CARBONATE OF AMMONIA
American Agricultural Chemical Co., New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.

CARS—For Moving Materials
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CARTS—Fertilizer, Standard and Roller Bearing
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

CASTINGS—Acid Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.

CASTINGS—Iron and Steel
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CEMENT—Acid-Proof
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

CHAIN DRIVES—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAINS AND SPROCKETS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHAMBERS—Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CHEMICAL APPARATUS
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

CHEMICALS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Company, The, New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., E. I., Wilmington, Del.

CHEMICALS—Continued
Huber & Company, New York City.
Phosphate Mining Co., The, New York City.
Wellmann, William E., Baltimore, Md.

CHEMICAL PLANT CONSTRUCTION
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Stillwell & Gladding, New York City.
Wiley & Company, Baltimore, Md.

CLUTCHES
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

CONCENTRATORS—Sulphuric Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.

CONDITIONERS AND FILLERS
American Limestone Co., Knoxville, Tenn.
Phosphate Mining Co., The, New York City.

CONTACT ACID PLANTS
Chemical Construction Corp., New York City.

COPPER SULPHATE
Tennessee Corporation, Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

CRANES AND DERRICKS
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

CYANAMID
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

DENS—Superphosphate
Chemical Construction Corp., New York City.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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DISINTEGRATORS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DRYERS—Direct Heat
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.

DRIVES—Electric
Link-Belt Company, Philadelphia, Chicago.

DUMP CARS
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

DUST COLLECTING SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELECTRIC MOTORS AND APPLIANCES
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ELEVATORS AND CONVEYORS—Portable
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

ENGINES—Steam
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

EXCAVATORS AND DREDGES—Drag Line and Cableway
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.
Link Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.

FERTILIZER MANUFACTURERS
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Farmers Fertilizer Co., Columbus, Ohio
International Agricultural Corp., New York City.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
McIver & Son, Alex. M., Charleston, S. C.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

FOUNDERS AND MACHINISTS
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GARBAGE TANKAGE
Wellmann, William E., Baltimore, Md.

GEARS—Machine Moulded and Cut
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

GEARS—Silent
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

GELATINE AND GLUE
American Agricultural Chemical Co., New York City.

GUANO
Baker & Bro., H. J., New York City.

HOISTS—Electric, Floor and Cage Operated, Portable
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.

HOPPERS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

IRON SULPHATE
Tennessee Corporation, Atlanta, Ga.

INSECTICIDES
American Agricultural Chemical Co., New York City.

LACING—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

LIMESTONE
American Agricultural Chemical Co., New York City.
American Limestone Co., Knoxville, Tenn.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Wellmann, William E., Baltimore, Md.

LOADERS—Car and Wagon, for Fertilizers
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making
Atlanta Utility Works, East Point, Ga.
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.
Duriron Co., Inc., The, Dayton, Ohio.
Fairlie, Andrew M., Atlanta, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Coal and Ash Handling
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Elevating and Conveying
Atlanta Utility Works, East Point, Ga.
Hayward Company, The, New York City.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

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MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Power Transmission
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MACHINERY—Pumping
Atlanta Utility Works, East Point, Ga.
Duriron Co., Inc., The, Dayton, Ohio.

MACHINERY—Tankage and Fish Scrap
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MAGNETS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

MANGANESE SULPHATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

NITRATE OF SODA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Company, The, New York City.
Bradley & Baker, New York City.
Chilean Nitrate Sales Corp., New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

NITRATE OVENS AND APPARATUS
Chemical Construction Corp., New York City.

NITROGEN SOLUTIONS
Barrett Company, The, New York City

NITROGENOUS ORGANIC MATERIAL
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
DuPont de Nemours & Co., Wilmington, Del.
Huber & Company, New York City.
International Agricultural Corp., New York City.
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.

PACKING—For Acid Towers
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Chemical Construction Corp., New York City.

PANS AND POTS
Stedman's Foundry and Mach. Works, Aurora, Ind.

PHOSPHATE MINING PLANTS
Chemical Construction Corp., New York City.

PHOSPHATE ROCK
American Agricultural Chemical Co., New York City.
American Cyanamid Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Charleston Mining Co., Inc., Richmond, Va.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Jett, Joseph C., Norfolk, Va.
Phosphate Mining Co., The, New York City.
Ruhm, H. D., Mount Pleasant, Tenn.
Schmaltz, Jos. H., Chicago, Ill.
Southern Phosphate Corp., Baltimore, Md.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

PIPE—Acid Resisting
Duriron Co., Inc., The, Dayton, Ohio.

PIPES—Chemical Stoneware
Chemical Construction Corp., New York City.

PIPES—Wooden
Stedman's Foundry and Mach. Works, Aurora, Ind.

PLANT CONSTRUCTION—Fertilizer and Acid
Chemical Construction Corp., New York City.
Fairlie, Andrew M., Atlanta, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.

POTASH SALTS—Dealers and Brokers
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, Del.
Wellmann, William E., Baltimore, Md.

POTASH SALTS—Manufacturers and Importers
American Potash and Chem. Corp., New York City.
Potash Co. of America, Baltimore, Md.
United States Potash Co., New York City.

PULLEYS AND HANGERS
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

PUMPS—Acid-Resisting
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

PYRITES—Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., New York City.
Jett, Joseph C., Norfolk, Va.
Wellmann, William E., Baltimore, Md.

QUARTZ
Charlotte Chem. Laboratories, Inc., Charlotte, N. C.

RINGS—Sulphuric Acid Tower
Chemical Construction Corp., New York City.

ROUGH AMMONIATES
Bradley & Baker, New York City.
Schmaltz, Jos. H., Chicago, Ill.
Wellmann, William E., Baltimore, Md.

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SCALES—Including Automatic Bagging
Atlanta Utility Works, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SCRAPERS—Drag
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Hayward Company, The, New York City.
Link-Belt Company, Philadelphia, Chicago.

SCREENS
Atlanta Utility Works, East Point, Ga.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Including Vibrating
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.

SEPARATORS—Magnetic
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHAFTING
Atlanta Utility Works, East Point, Ga.
Link-Belt Company, Philadelphia, Chicago.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman's Foundry and Mach. Works, Aurora, Ind.

SHOVELS—Power
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Link-Belt Company, Philadelphia, Chicago.
Link-Belt Speeder Corp., Chicago, Ill., and Cedar Rapids, Iowa.
Sackett & Sons Co., The A. J., Baltimore, Md.

SPRAYS—Acid Chambers
Monarch Mfg. Works, Inc., Philadelphia, Pa.

SPROCKET WHEELS (See Chains and Sprockets)

STACKS
Sackett & Sons Co., The A. J., Baltimore, Md.

SULPHATE OF AMMONIA
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Barrett Company, The, New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Hydrocarbon Products Co., New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

SULPHUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Freeport Sulphur Co., New York City.
Texas Gulf Sulphur Co., New York City.

SULPHURIC ACID
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
Jett, Joseph C., Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.

SULPHURIC ACID—Continued
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Wellmann, William E., Baltimore, Md.

SUPERPHOSPHATE
American Agricultural Chemical Co., New York City.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
International Agricultural Corp., New York City.
Jett, Joseph C., Norfolk, Va.
Schmaltz, Jos. H., Chicago, Ill.
Taylor, Henry L., Wilmington, N. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Wellmann, William E., Baltimore, Md.

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International Agricultural Corp., New York City.
Phosphate Mining Co., The, New York City.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SYPHONS—For Acid
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TALLOW AND GREASE
American Agricultural Chemical Co., New York City.

TANKAGE
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Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
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Bradley & Baker, New York City.
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McIver & Son, Alex. M., Charleston, S. C.
Schmaltz, Jos. H., Chicago, Ill.
Smith-Rowland, Norfolk, Va.
Taylor, Henry L., Wilmington, N. C.
Wellmann, William E., Baltimore, Md.

TANKAGE—Garbage
Huber & Company, New York City.

TANKS
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Sackett & Sons, Co., The A. J., Baltimore, Md.

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UREA
DuPont de Nemours & Co., E. I., Wilmington, Del.

UREA-AMMONIA LIQUOR
DuPont de Nemours & Co., E. I., Wilmington, Del.

VALVES—Acid-Resisting
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Charlotte Chem. Laboratories, Inc., Charlotte, N. C.
Duriron Co., Inc., The, Dayton, Ohio.
Jeffrey Manufacturing Co., The, Columbus, Ohio.
Monarch Mfg. Works, Inc., Philadelphia, Pa.

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